Safe Harbor Notice

Except for the historical information contained herein, the matters addressed in this presentation are forward-looking statements that involve certain risks and uncertainties that could cause actual results to differ materially, including but not limited to weather, impact of competitive products and pricing, industry-wide shifts in the supply and demand for semiconductor products, rapid technology change, semiconductor industry cycle, and general economic conditions.

Except as required by law, Andes undertake no obligation to update any forward-looking statement, whether as a result of new information, future events or otherwise.
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Company Overview

http://www.andestech.com
Andes Highlights

- Founded in March 2005 in Hsinchu Science Park, Taiwan, ROC.
- Well-established high technology IPO company
- Over 240 people; 80% are engineers.
- TSMC OIP Award “Partner of the Year” for New IP (2015)
- Founding Premier membership in the RISC-V International Association (RISC-V Foundation) (2020)
- AI Global Media Award “Most Outstanding Embedded Processor IP Supplier” (2020)
- Hsinchu Science Park Innovation Award - AndesCore™ NX27V (2020)
- EE Awards - “Taiwan-Product Award” & ”Asia-Company Award” (2021)

Andes Mission

- Innovate performance-efficient processor solution for low-power SoC

Emerging Opportunities

- Smart and Green electronic devices
- Cloud Computing and Internet of Things and Machine Learning
Business Status Overview

- **200+** commercial licensees
  - Geographically distributed in Taiwan, China, Korea, Japan, Europe, and USA
  - **500+** license agreements signed

- **AndeSight™ IDE:**
  - **21,000+** installations

- **Eco-system:**
  - **500+** partners

- **9B+** Accumulative SoC Shipped
Operation Results
3Q21 Revenue Analysis

YoY: +83.5%
QoQ: -7.3%

(NT$ thousands)

250,000
240,000
230,000
220,000
210,000
200,000
190,000
180,000
170,000
160,000
150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0

3Q20: 104,768
2Q21: 207,370
3Q21: 192,228

RISC-V®
21Q1-Q3 Revenue Analysis

YoY
+76.3%

(NT$ thousands)

- 600,000
- 500,000
- 400,000
- 300,000
- 200,000
- 100,000
- 0

20 Q1-Q3: 312,427
21 Q1-Q3: 550,724
21Q1-Q3 Top 10 Customers Analysis by Revenue

Top 10 Customer Contributed 61% Revenue

(NT$ thousands)
3Q21 Royalty Analysis

YoY +77.6%
QoQ +29.9%

(NT$ thousands)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>3Q20</td>
<td>36,969</td>
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<tr>
<td>2Q21</td>
<td>50,569</td>
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<tr>
<td>3Q21</td>
<td>65,668</td>
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</table>
21Q1-Q3 Royalty Analysis

YoY +70.2%

(NT$ thousands)

- 180,000
- 160,000
- 140,000
- 120,000
- 100,000
- 80,000
- 60,000
- 40,000
- 20,000
- 0

20 Q1-Q3
100,439

21 Q1-Q3
170,904
21Q1-Q3 Top 10 Royalty Contributors Analysis by Application

Top 10 Royalty Customers Contribution Analysis: 89%

(NT$ thousands)
## Royalty Analysis

(NT$ thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Royalty</th>
<th>Customer Numbers</th>
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<tr>
<td>2011</td>
<td>445</td>
<td>1</td>
</tr>
<tr>
<td>2012</td>
<td>660</td>
<td>2</td>
</tr>
<tr>
<td>2013</td>
<td>1,285</td>
<td>5</td>
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<tr>
<td>2014</td>
<td>10,819</td>
<td>9</td>
</tr>
<tr>
<td>2015</td>
<td>12,232</td>
<td>15</td>
</tr>
<tr>
<td>2016</td>
<td>13,320</td>
<td>15</td>
</tr>
<tr>
<td>2017</td>
<td>38,287</td>
<td>25</td>
</tr>
<tr>
<td>2018</td>
<td>74,953</td>
<td>28</td>
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<tr>
<td>2019</td>
<td>106,716</td>
<td>33</td>
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<tr>
<td>2020</td>
<td>158,792</td>
<td>41</td>
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<tr>
<td>2021 Q1-Q3</td>
<td>170,904</td>
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</table>
3Q21 Consolidated Gross Margin

<table>
<thead>
<tr>
<th></th>
<th>3Q20</th>
<th>2Q21</th>
<th>3Q21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Profit</td>
<td>104,177</td>
<td>207,160</td>
<td>192,022</td>
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<tr>
<td>Gross Margin</td>
<td>99.43%</td>
<td>99.90%</td>
<td>99.89%</td>
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</table>
Q1-Q3 21 Consolidated Gross Margin

<table>
<thead>
<tr>
<th></th>
<th>20 Q1-Q3</th>
<th>21 Q1-Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>營業毛利</td>
<td>311,568</td>
<td>549,882</td>
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<tr>
<td>毛利率</td>
<td>99.73%</td>
<td>99.85%</td>
</tr>
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</table>

(NT$ thousands)
3Q21 Consolidated Operating Expenses

QoQ +22.1 %
YoY +27.6 %

(NT$ thousands)

<table>
<thead>
<tr>
<th>Quarter</th>
<th>R&amp;D Expenses</th>
<th>Administration Expenses</th>
<th>Selling Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>3Q20</td>
<td>27,644</td>
<td>42,904</td>
<td></td>
</tr>
<tr>
<td>2Q21</td>
<td>18,761</td>
<td>50,218</td>
<td></td>
</tr>
<tr>
<td>3Q21</td>
<td>19,684</td>
<td>56,135</td>
<td></td>
</tr>
</tbody>
</table>
Q1-Q3 21 Consolidated Operating Expenses

YoY
+11.1 %

(NT$ thousands)

<table>
<thead>
<tr>
<th>20 Q1-Q3</th>
<th>21 Q1-Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>180,629</td>
<td>233,417</td>
</tr>
<tr>
<td>87,409</td>
<td>57,555</td>
</tr>
<tr>
<td>131,732</td>
<td>153,157</td>
</tr>
</tbody>
</table>

- R&D expenses
- Administration expenses
- Selling expenses
3Q21 Consolidated Operating Income (Loss)

QoQ: -66.1%

YoY: -%

(NT$ thousands)

3Q20: (27,971)
2Q21: 69,080
3Q21: 23,416
Q1-Q3 21 Consolidated Operating Income (Loss)

YoY
- %

(NT$ thousands)

150,000
105,753
100,000
50,000

20 Q1-Q3
21 Q1-Q3

(88,202)
3Q21 Consolidated Operating Margin

YoY: +38.88 PT
QoQ: -21.13 PT

3Q20: -26.70%
2Q21: 33.31%
3Q21: 12.18%
Q1-Q3 21 Consolidated Operating Margin

YoY
+47.44 PT

(%)
Q1-Q3 21 Consolidated Net Income (Loss)

QoQ -27.0 %
YoY -%

(NT$ thousands)

3Q20: -29,407
2Q21: 43,887
3Q21: 60,111
Q1-Q3 21 Consolidated Net Income (Loss)

YOY - %

(NT$ thousands)

20 Q1-Q3: (84,876)
21 Q1-Q3: 131,663

YOY: 131,663 - 84,876 = 46,787
3Q21 Consolidated Net Profit Margin

YoY +50.9 PT
QoQ -6.16 PT

3Q20: -28.07%
2Q21: 28.99%
3Q21: 22.83%
Q1-Q3 21 Consolidated Net Profit Margin

YoY
+ 51.08 PT

 (%)

20 Q1-Q3
21 Q1-Q3

23.91%

-27.17%
3Q21 Consolidated EPS

YoY: +1.68 NT$

QoQ: -0.42 NT$

<table>
<thead>
<tr>
<th>Quarter</th>
<th>EPS</th>
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<tr>
<td>3Q20</td>
<td>-0.69</td>
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<tr>
<td>2Q21</td>
<td>1.41</td>
</tr>
<tr>
<td>3Q21</td>
<td>0.99</td>
</tr>
</tbody>
</table>
Q1-Q3 21 Consolidated EPS

YoY
+5.04 $
21Q1-Q3 Revenue Analysis by Payment Model

- License Fee: 56%
- Running Royalty: 31%
- Maintenance & Others: 4%
- Custom Computing Service: 9%
21Q1-Q3 Revenue Analysis by Region

- Taiwan: 38%
- China: 33%
- USA: 4%
- Japan: 3%
- Europe: 1%
- Korea: 1%
3Q21 Revenue Analysis - RISC-V

(NT$ thousands)

- 3Q20: 52,593 (V3) 52,175 (RISC-V)
- 2Q21: 75,776 (V3) 63% (RISC-V)
- 3Q21: 79,530 (V3) 59% (RISC-V)

V3 RISC-V
Q1-Q3 21 Revenue Analysis - RISC-V

<table>
<thead>
<tr>
<th></th>
<th>Q1-Q3 2020</th>
<th>Q1-Q3 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>V3</td>
<td>137,307</td>
<td>213,990</td>
</tr>
<tr>
<td>RISC-V</td>
<td>175,120</td>
<td>336,734</td>
</tr>
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</table>

(NT$ thousands)
Product Applications

http://www.andestech.com
Andes Updates

- A 16-year-old public CPU IP company
- 2B+ Andes-Embedded SoC annually in 2020

- A founding premier member of the RISC-V International
- An active role in RISC-V International & its extension task groups
  ■ RISC-V Board Director
  ■ Member of Technical Steering Committee
  ■ RISC-V Ambassador
  ■ Chair of P-extension (Packed DSP/SIMD) Task Group
  ■ Co-chair of Fast Interrupt Task Group
  ■ Vice Chair of TEE Task Group

- A major open source maintainer/contributor

GNU Toolchains

RISC-V LLVM Porting Effort

- Alex Bradbury is in charge of RISC-V LLVM
- Talk yesterday afternoon
- Poster on Tuesday night
- RV32IM[A]F support upstream
- Missing hard-float calling convention
- Missing 64-bit support
- Missing compressed support
- Clang, Go, and OpenJDK have run code
- Rust port in progress
- Poster on Tuesday

LLVM

RISC-V Linux Kernel Port

- Linux: January, 2018
- Only RISC-V-based systems
- Drivers are trickling in now

Linux
Andes Embedded in Various Applications

- Smart Speakers: WiFi IoT
- Bike Sharing: GPS Ctrl
- X-Trail: ADAS Ctrl
- Switch: Game Flash Ctrl

- In leading machine learning computers for datacenter
- In tier-one switch routers for datacenter
- Recent applications: 5G networking, WiFi 6/7, AI processors (using Andes Custom Extension, ACE)
V5 Adoptions: From MCU to Datacenters

- **Edge to Cloud**
  - ADAS
  - AIoT
  - Blockchain
  - FPGA
  - MCU
  - Multimedia
  - Security
  - Wireless (BT/WiFi)

- **40nm to 5nm**

- **Many in AI**
  - Datacenter AI accelerators
  - SSD: enterprise (& consumer)
  - 5G macro/small cells
Andes RISC-V Cores Adopted in SoC

- Single core
- 2-8 cores
- > 30 cores
- > 100 cores
- > 1000 cores
New Products and Ecosystems

http://www.andestech.com
Andes RISC-V Product Overview

AndesCore™ Processors
- Highly optimized design with leading PPA

AndeSight™ Tools
- Professional IDE with high code quality

AndeSoft™ Stacks
- Extensive SW stacks from bare metal, RTOS to Linux

AndeShape™ Platforms
- Handy peripheral IPs to speed up SoC construction

AndeStar™ Architecture V5
- Best extensions to RISC-V
Andes V5 Architecture for All Levels of Computing

AndeStar™ V5 CPUs
- RISC-V
- RV32/64
- Andes Extension

N/D-series
- N22 N(X)25 D25...

A-series
- A(X)25 A(X)27 A(X)45
- Multicore...

Vector
- NX27V NX45V...

Conventional Computing Architecture
- Leading PPA Embedded Processor
  - IoT, Sensing, Storage, Audio, GPS

High Performance and Power Efficient AP
- 5G, AI, Datacenter, Video Surveillance, Networking

Domain Specific Architecture (DSA)
- Define custom instruction to handle time critical codes
- Andes Custom Extension
- Better approach for accelerator/co-processor to do particular jobs
- Automation Tool for the generation of toolchain, ISS, partial RTL and verification

Andes V5 CPUs
- Andes Technology
- IoT, Sensing, Storage, Audio, GPS
- High Performance and Power Efficient AP
- Cray Style, Scalable Vector Processor
- Datacenter, Server, Deep Learning
Andes RISC-V Product Roadmap

**RV32/RV64**

- **Cache-Coherent 1-4 Cores**
  - A25MP
  - AX25MP

- **Linux with FPU/DSP**
  - A25
  - AX25

- **Fast/Compact with FPU/DSP**
  - N25F
  - D25F
  - NX25F

- **5-stage (1.1 GHz)**

**27-Series:**
- Vector Ext. MemBoost
  - NX27V
  - A27/AX27
  - A27L2/AX27L2 and more.

**45-Series:**
- Dual Issue MemBoost
  - N45/NX45
  - D45/DX45
  - A45/AX45
  - A45MP/AX45MP and more.

**Benefits**
- 512-bit SIMD raises MobileNet by 66x (CNN for mobile vision)
- Boost performance by 50%
- Raise bandwidth to 3x; Cut latency by 40%

**Superscalar**
- 8-stage (1.2 GHz)

**Vector Ext.**
- 5-stage (1.1 GHz)

**Fast/Compact with FPU/DSP**
- N22
  - 2-stage (700 MHz)
AndeCore™ 45-Series

32-bit AndesCore™ N45/D45/A45/A45MP
64-bit AndesCore™ NX45/AX45/AX45MP
AndesCore™ 45-Series Overview

- 8-stage In-Order Dual-Issue
- AndeStar™ V5 ISA:
  - RV*GCN (S/D FPU): All Series
  - RV*P-ext (DSP/SIMD): D45/A(X)45
  - MMU for Linux Applications: A(X)45
- MemBoost memory subsystem
- Low power dynamic branch prediction
- Unaligned data accesses
- Fast or small multiplier
- StackSafe™ (Andes Ext.)
- CoDense™ (Andes Ext.)
- Multi-core support: A(X)45MP
AndesCore™ 45 vs. 25 Series Performance Enhancement

- 1.5X Coremark & Dhrystone performance enhancement, compared with single-issue 25 series
AX45 Can Do More (vs. 64bit A-series)

- A53
  - 8-stage In-Order Dual Issue
  - Widely adopted by industries in many applications

- AX45
  - 8-stage In-Order Dual Issue
  - Performance is better!
    - Coremark/MHz: 1.32x
    - Dhrystone/MHz: 1.37x
Target Applications of 27 & 45-Series

- AI/Deep Learning
- AR/VR
- 5G
- Networking
- Storage

- Video Surveillance
- ADAS
- V2X (Vehicle to Everything)
- IVI (In-Vehicle-Infotainment)

Metaverse and more...
Andes Processors to Fit Your AI

- Voice trigger
- Voice command
- Always-on
- Face trigger
- Object detection
- Intelligent HMI
- Barge-in
- Beamforming
- Speech to text
- Natural language

- Face unlock
- Bokeh
- Avatar
- SLAM
- Gesture recognition
- High resolution
- > 1 camera

- ADAS, HDR
- > 10 cameras

Smart Camera

Smart IoT Devices

Smart Home

Mobile AR/VR Surveillance

Automotive

Data Center

~30 MOPS

~100 MOPS

> 1 GOPS

>1 TOPS

>10 TOPS

>100 TOPS

N-Series CPUs

D/A-Series CPUs

Vector CPUs

Mobile AR/VR Surveillance

Automotive

Data Center

~30 MOPS

~100 MOPS

> 1 GOPS

>1 TOPS

>10 TOPS

>100 TOPS

N-Series CPUs

D/A-Series CPUs

Vector CPUs

Andes Technology

48
RISC-V DSP Extension

- Andes contributed market-proven DSP (SIMD) as P-Extension
- Designed to accelerate slow video, audio/voice and low data rate DSP workloads

❖ Increase power efficiency to your DSP applications

Real world speedup using P-Extension

- MP3 decode: 2x speedup
- AMR voice codec: 3.7x speedup
- ML-KWS (keyword spotting): 5.2x speedup
- PNET (90% of Face Detection): 8.9x speedup
- CIFAR10 (Image Classification): 14x speedup

Andes Technology
NX27V One Vector for All Implementations

Cloud Computing – Datacenter, HPC, Server

Edge Computing – 5G, Vision Processing

Endpoint Computing – Natural Language Processing

* Configurable compute data width (VLEN)
Andes Custom Extension

- ACE unlocks RISC-V’s Potential of DSA
  - Define ACE instruction to handle time critical codes
  - Another approach to co-processor or accelerators

- All-in-one COPILOT development environment
  - Automation tool and ease of use
  - Extensions are easy to re-use, can be used as a library
Taking RISC-V Cores to Next Level

Andes is the *world-leading* supplier shipping the commercial RISC-V cores to market with the support of

<table>
<thead>
<tr>
<th>Extension</th>
<th>Supported Models</th>
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<tbody>
<tr>
<td>P-Extension</td>
<td>D25, D45, A(X)25(MP), A(X)27(L2), A(X)45(MP)</td>
</tr>
<tr>
<td>V-Extension</td>
<td>NX27V, NX45V</td>
</tr>
<tr>
<td>Custom-Extension</td>
<td>Entire 25, 27, 45 series (w/ ACE* support)</td>
</tr>
</tbody>
</table>

*: Andes Custom Extension
Bring Andes Strength to RISC-V Cores

Performance & Extensibility
- Leading PPA and code size
- Rich data processing in P, V, and ACE

Configurability
- Flexible configurations for rich features

Maturity
- Compiler optimizations, and SW stacks
- Comprehensive features in AndeSight IDE
Aggressive in RISC-V Community

Foundation Task Groups (partial list)

- Contributing hardware architecture extensions
  - Chair of the P-extension (Packed SIMD/DSP) Task Group
  - Co-chair of Fast Interrupts Task Group
  - Closely reviewing activities of other Task Groups
Andes Helps Strengthen RISC-V Ecosystem

- More choices for customers are good
- Andes works closely with partners to grow RISC-V ecosystem
Andes Position in RISC-V

- Complete product portfolio
- Reliable RISC-V core IP vendor
- Extreme low power consumption, high computing efficiency
- World’s leading P-, V- and Custom-Ext. Capable RISC-V cores
- Professional custom computing service
Concluding Remarks

http://www.andestech.com
Successfully rolled out new series of RISC-V cores (w/ leading P-, V- and Custom-Ext.), custom computing service and FreeStart program to extend more oppty.

Aggressively involved in RISC-V International new technology development, contributing and leveraging RISC-V eco-system.

Becoming a technology contributor, market promoter, and sales leader in the RISC-V industry

A Trusted Computing Expert